

LIQUID NITROGEN CRYOFREEZE*

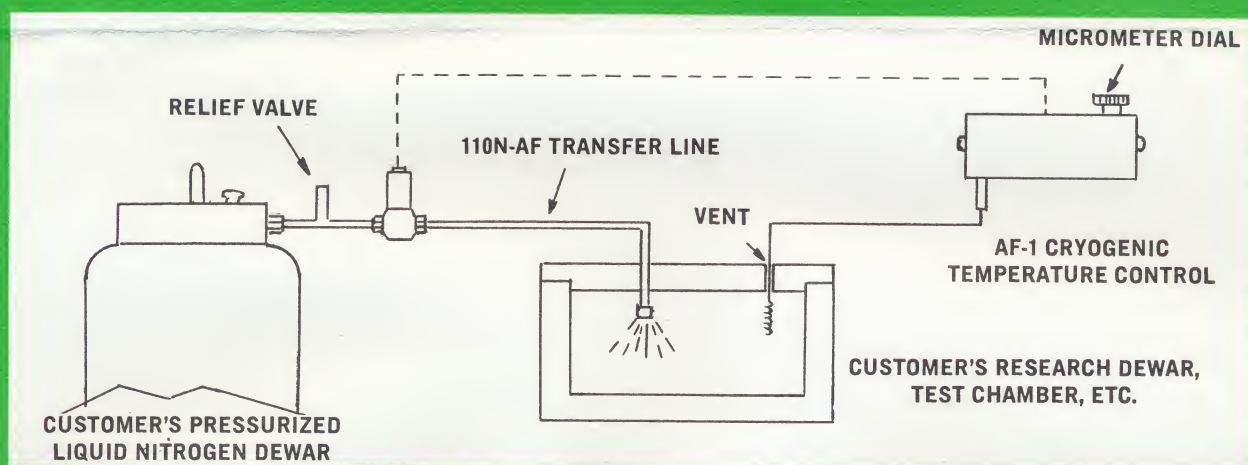
®

*A BASIC SYSTEM FOR INDUSTRY AND RESEARCH. THE ALMAC CRYOGENIC TEMPERATURE CONTROL PROVIDES A STABLE TEMPERATURE ENVIRONMENT AT ANY SETTING BETWEEN AMBIENT AND MINUS 150° F.

EXPERIMENTAL CRYOGENICS

ENVIRONMENTAL TEST CHAMBERS

BIOLOGICAL FREEZING



ALMAC CRYOGENIC TEMPERATURE CONTROL Model AF-1

List Price \$95.00

Precision built micrometer adjustment. Minus 150° F. to +200° F. calibrated adjustable range. One degree F. on-off differential with standard head compensation from -65° F. to +160° F. ambient temperatures. Aluminum case with black wrinkle finish; brass bellows housing; 6' stainless steel capillary with 40" of sensing line formed into a 7/8" OD by 6" long bulb. Snap action switch, class R, normally closed circuit suitable for 180° F. ambient temperatures. Electrical rating standardly 115/230 volts AC. Mounting — two #10 screws at 4 5/8" c-c.

ALMAC TRANSFER LINE KIT Model 110N-AF

List Price \$57.50

Complete kit ready to install. Includes 6' of flexible Nylon tube; relief valve; 1/4" orifice, 10 watt, 115 volt AC normally closed solenoid valve; spray nozzle and all required fittings.

ALMAC CRYOGENIC THERMOMETER Model AF-200

List Price \$9.95

Precision quality thermometer for general testing to liquid Nitrogen temperature. Range -200° C. to +30° C. with 1° C. least count. Stem diameter 6-7 mm. with round top. Thermometer is 12" long, designed for total immersion.

ALL PRICES SUBJECT TO CHANGE — F. O. B. OAKLAND, CALIFORNIA



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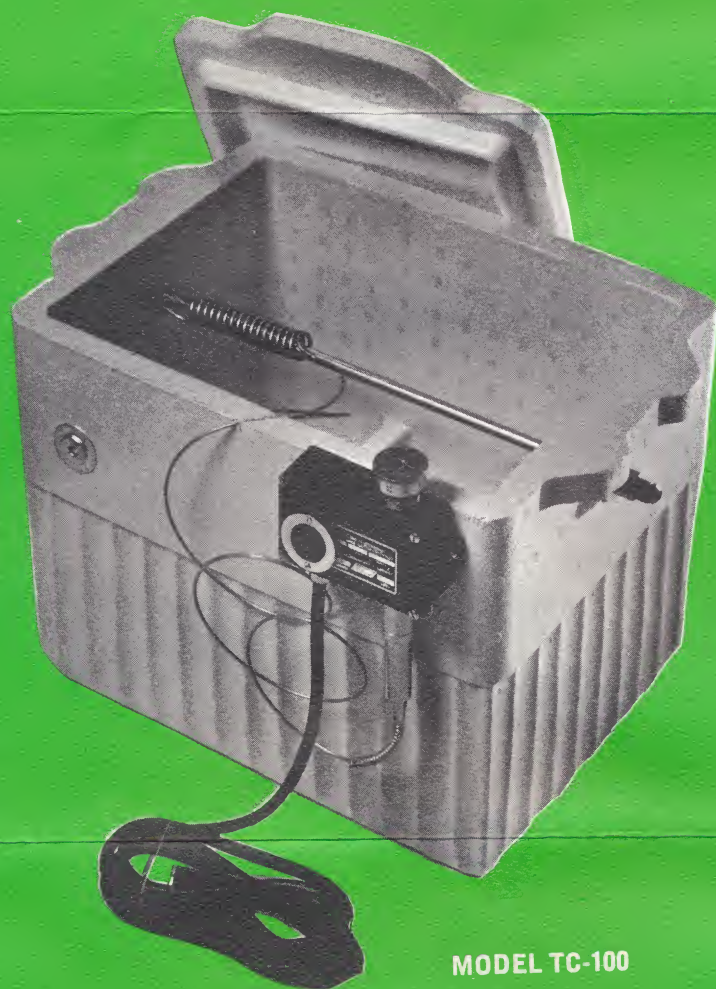
1108 - 26th Street, Oakland, California 94607

Phone (Area Code 415) 832-1505

ALMAC TEMPERATURE CHAMBER

Almac developed the Liquid Nitrogen Cryofreeze primarily for research. Environmental chambers are costly and usually limited in size, however, with the introduction of foam plastics for efficient insulation, the technician can foam into place his own chamber. The new foam plastic baskets which have been used for short term liquid nitrogen shrink fitting, can also be used with the Cryofreeze system.

A Complete System



MODEL TC-100

Alcohol in a stainless steel dewar has been used in biological freezing. When the alcohol begins to thicken it is pumped out and the expanding nitrogen gas takes over the cooling.

Technicians have used shaved dry ice for different temperatures but have encountered difficulty in maintaining a precise temperature environment. Cryofreeze can maintain a stable environment.

Liquid nitrogen absorbs 165 B. T. U.'s per pound in warming to 0° F. Starting at 320.4° F. cooling can be completed quickly. Expanding close to 700 to 1, nitrogen gas rolls to every corner of the test chamber for rapid cooling.

The technician designing his own chamber must follow all safety procedures in the handling of liquid nitrogen, particularly allowing for the venting of the expanding gas.

Almac Temperature Chamber Model TC-100

List Price \$200.00

Complete temperature system (less model AF-200 thermometer) includes Model AF-1 temperature control and Model 110N-AF transfer line kit modified for header operation which sprays nitrogen into an expanded polystyrene basket. The basket measures inside length approx. 13 $\frac{7}{8}$ ", inside width 9 $\frac{1}{2}$ ", inside depth 11". Complete system ready to plug into 115V AC outlet and to connect to customer's pressurized liquid nitrogen dewar.

Sixty Minute Timer Model BT-60 List Price \$5.00

Spring driven timer times up to sixty minutes in one minute steps. Built-in belltone used in conjunction with Almac Temperature Control Model AF-1 for slow freezing of biological materials. One freezing curve allows for 12 hours of conditioning at 40° F. then dialing 2° F. through 0° F. then dialing 4° F. a minute.



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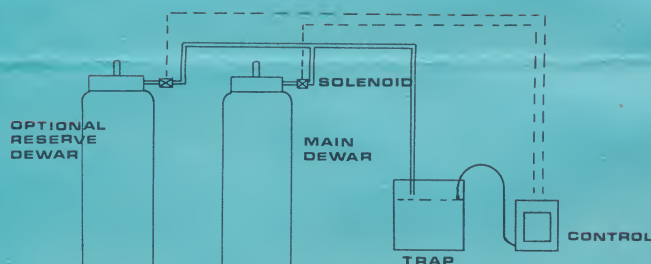
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MODEL
CR-C
Liquid nitrogen level control

Operation

The sensor tip is positioned in the cold trap at the lowest level of liquid nitrogen desired. The high level is determined by the duration of transfer from the supply source which is controlled by a timer setting. The operator sets the timer to the longest time that can elapse without overfilling the trap. An amber indicator light shows that the sensor tip is covered with liquid nitrogen and a red alarm light shows and an audible buzzer sounds when the supply becomes exhausted. This control provides an auxiliary power supply for switching to a secondary supply source. By adding a relay to the alarm circuit, a gate valve or a heater of a diffusion pump may be de-energized. A switch provides a means of operating the control manually such as during initial trap filling.



For companion transfer lines see Form AC-31.

†Please add suffix S for stainless sensor and C for copper sensor when ordering. Unless otherwise requested, stainless sensor will be provided.

The CR-C control carries a full one-year factory warranty.

ALMAC

CRYOFREEZE[®] *

CONTROLS

* Cryogenic control systems for Research and Industry



LIST PRICE
\$160

Specifications

Housed in gray hammertone cabinet 4" x 5" x 6".

Readout timer range 15 seconds to 15 minutes.

Power requirements 115 VAC 60 cycle.

Standard sensor supplied 48" flexible capillary tube $\frac{3}{32}$ " diameter with 12" x $\frac{1}{8}$ " stainless steel probe for easy access traps.

Optional sensor 60" all copper capillary tube $\frac{3}{32}$ " diameter for curved vent lines up to 90° radial bends.

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ALMAC

CRYOFREEZE[®] *

CONTROLS

MODEL
CR-P[†]

Liquid nitrogen level control

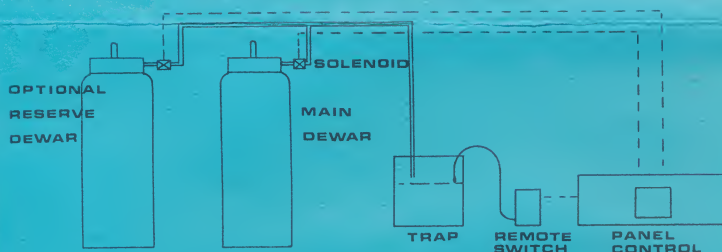
* **Cryogenic control systems for Research and Industry**

Operation

The CR-P panel type control with remote sensor switch gives complete flexibility, adaptability and ease of operation. The remote sensor can be placed in any convenient position and distance from the control panel. The control panel can be located for maximum convenience and practicability. Operation of the CR-P is similar to that of the CR-C control shown on opposite page.



**LIST
PRICE
\$175**



For companion transfer lines see Form AC-31.

†Please add suffix S for stainless sensor and C for copper sensor when ordering. Unless otherwise requested, stainless sensor will be provided.

Specifications

Panel type control, gray hammertone 19" x 5¼".

Readout timer range 15 seconds to 5 minutes.

Power requirements 115 VAC 60 cycles.

Standard remote sensor 48" capillary tube ⅜" diameter with 12" x ⅛" stainless steel probe. Remote sensor cabinet 4" x 2⅛" x 1⅝" in gray hammertone. 10' panel cord standard. Other lengths on request.

Optional remote sensor 60" all copper capillary tube ⅜" diameter for curved vent lines up to 90° radial bends.

The CR-P panel control carries a full one-year factory warranty.

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LIQUID NITROGEN

SOLENOID

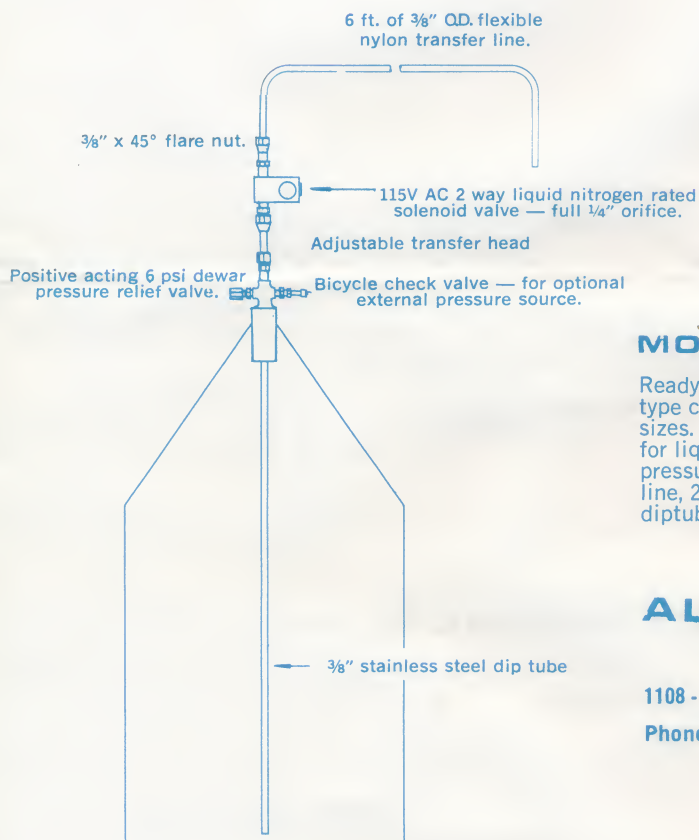
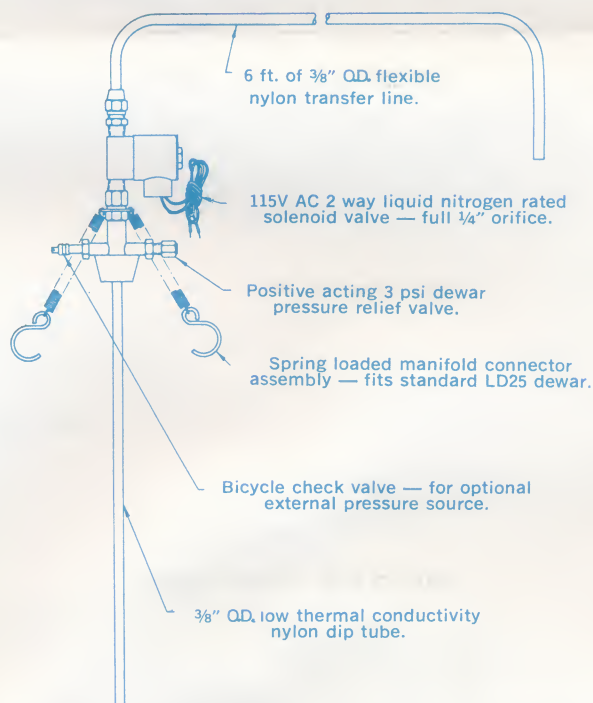
OPERATED



MODEL 25 SP

Ready to install to super insulated 1½" neck LD 25 liter containers. The normal boil off provides the pressure for liquid transfer. A check valve for external pressurizing is provided. Transfer lines include flexible nylon line, 2-way liquid nitrogen solenoid, nylon diptube and all fittings.

List Price \$57.50



MODEL 50 SP

Ready to install to narrow neck 5/8" thru 3/4" OD. type containers. Adjustable to 15-25 or 50 liter sizes. The normal boil-off provides the pressure for liquid transfer. A check valve for external pressurizing is provided. Includes flexible nylon line, 2-way liquid nitrogen solenoid, stainless diptube and all fittings.

List Price \$57.50

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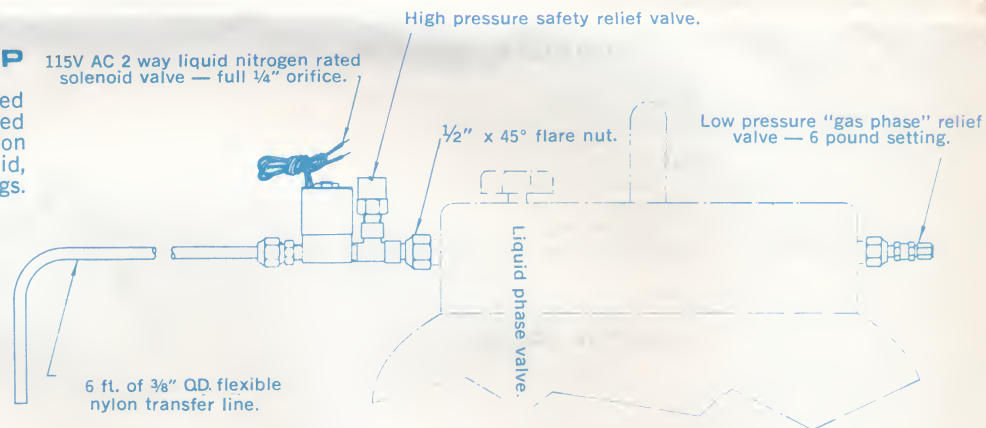
LIQUID NITROGEN SOLENOID OPERATED TRANSFER LINES



MODEL 110 SP

Ready to install to super insulated 110 and 160 liter self pressurized containers. Includes flexible nylon line, 2-way liquid nitrogen solenoid, relief valves and all fittings.

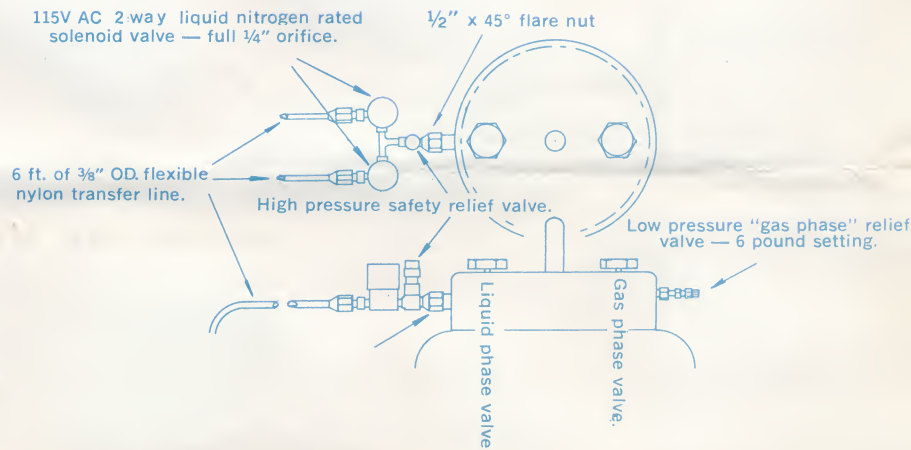
List Price \$59.50



MODEL 220 SP

Ready to install to super insulated 110 and 160 liter self pressurized containers. Designed for operating two ALMAC liquid nitrogen level controls from one dewar. Includes two flexible nylon lines, two solenoids, relief valves and all fittings.

List Price \$87.50



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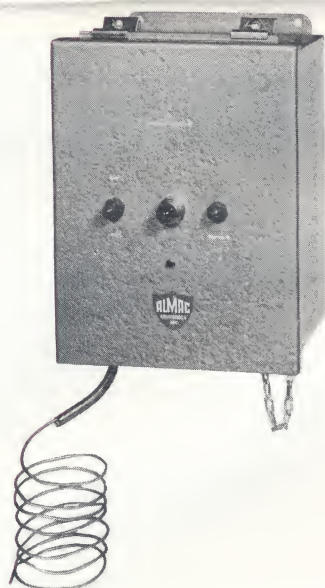
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Automatic Liquid Nitrogen Container Filler

ALMAC CRYOFREEZE[®] MODEL CR-25^{*}



ALMAC CRYOFREEZE-25 MODEL CR-25

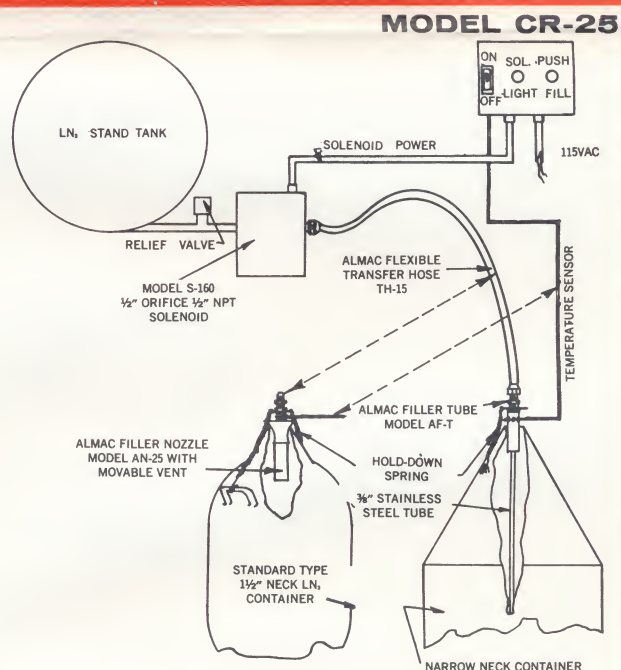
Liquid nitrogen filler control automatically shuts off the solenoid when the standard type 15, 25, or 50 liter container is full. Saves liquid nitrogen over manual filling. Control may be used from any larger container to any smaller vented container or to any container having a valve-controlled full trycock. Hammertone gray raintight cabinet 9" wide, 4½" deep, 15" high overall. 66" of all flexible sensor probe of ⅜" copper capillary tubing. Operation same as model CR-160.

LIST PRICE \$225.00

ALMAC FILLER TUBE AF-T

Efficiently and safely fills 15, 25, or 50 liter narrow neck containers. Overall height 19" x 1⅝" largest outside diameter, brass with ⅜" stainless steel dip tube.

LIST PRICE \$18.95



ALMAC FILLER NOZZLE AN-25*

Top fills super insulated 1½" I. D. neck 10 and 25 liter capacity containers. At lower pressures full liquid level sits just below stopper depth. All brass construction, overall height 7⅞", main tube O. D. 1⅝". Movable vent allows for excess nitrogen gas to safely vent and the top portion allows easy sensor placement.

LIST PRICE \$25.50

ALMAC FLEXIBLE TRANSFER HOSE TH-15

Bronze braided flexible hose 3 feet long, ⅝" I. D., approx. .625" O. D. terminating on both ends with ⅜" female 45° flare nuts.

LIST PRICE \$18.95

* PATENT PENDING



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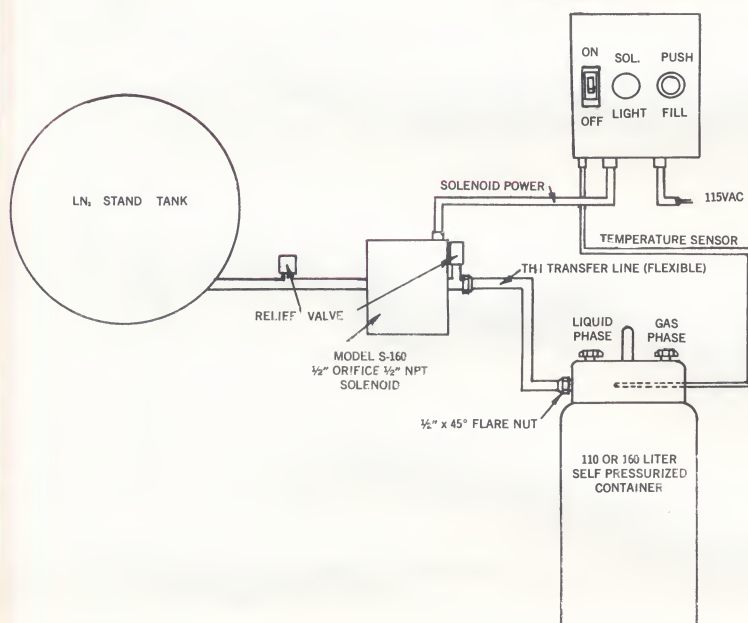
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Automatic Liquid Nitrogen Container Filler

ALMAC CRYOFREEZE[®] MODEL CR-160^{*}

MODEL CR-160



ALMAC CRYOFREEZE-160 MODEL CR-160

Automatically shuts off the solenoid when the 110 or 160 liter container is full. Adjustable temperature sensor is placed in the vent space of the storage container. When the start switch is pressed the solenoid is energized. Liquid nitrogen rises in the container and when full flows over the sensor de-energizing it and automatically stopping the filling cycle. The operator places the next container on the filling line, places sensor in vent space and presses button to commence cycle. The control may be used from any larger container to any smaller vented container. Hammer tone gray raintight cabinet 9" wide, 4 1/2" deep, 15" high overall, ready for conduit installation. 66" flexible sensor probe of 3/32" copper capillary tube connected at the terminal end to 8" of 1/8" diameter stainless tube.

LIST PRICE \$225.00

ALMAC TWO WAY NITROGEN SOLENOID — MODEL S-160
1/2" orifice 1/2" NPT. suitable for handling LN₂ from 10 P. S. I. to 125 P. S. I.

LIST PRICE \$80.00

ALMAC FLEXIBLE TRANSFER HOSE — MODEL TH-1

Bronze flexible hose 3 ft. long, 3/8" I. D., approx. .725" O. D. terminating on one end with a 1/2" 45 female flare nut and on the other end with a 3/8" NPT. Includes 235-pound high pressure safety relief valve.

LIST PRICE \$32.50

REPLACEMENT SENSING UNIT

Specify all-copper sensor for model CR-25 or copper sensor terminating at the end with 8" of stainless tube for model CR-160.

LIST PRICE \$50.00

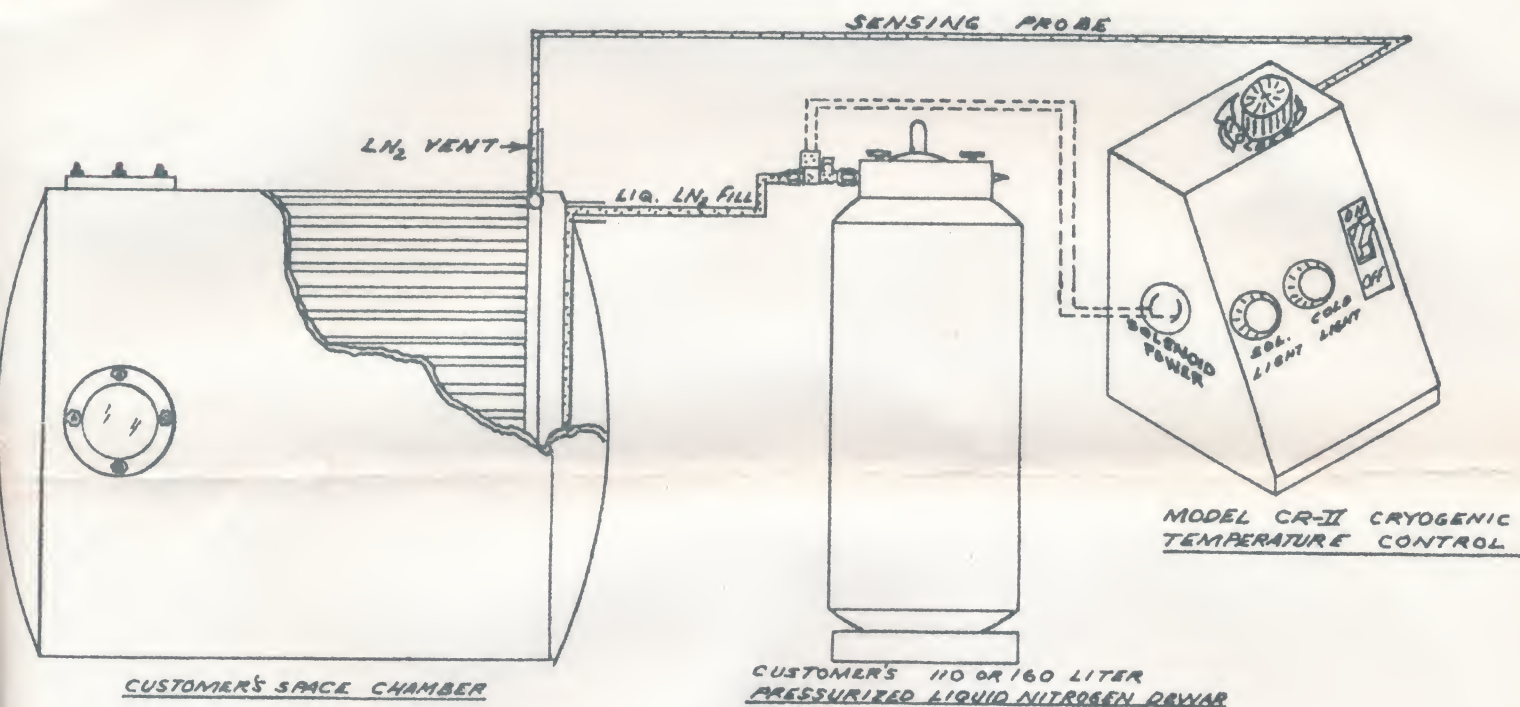
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ALMAC CRYOFREEZE II MODEL CR-II LIQUID NITROGEN TEMPERATURE CONTROL

LIST PRICE \$145.00

Non-calibrated, adjustable liquid nitrogen temperature control. Automatically maintains temperatures between that of liquid oxygen to liquid nitrogen temperatures in space chambers, cryowalls, cryopanel, non-reservoir baffle traps and helium cryostat cooling coils. Hammertone gray, sloping front cabinet 5" W x 4½" D x 4½" H with 8 feet of power cord. Flexible vapor charged sensor probe, 6' of 3/32" dia. copper tubing. Power requirements 115V AC 60 cycle.

OPERATION

The flexible sensing probe is placed inside the vent line. Allow control to operate until the solenoid red light is de-energized and the amber cold light is energized. To adjust to a colder temperature turn counter clockwise. For major temperature variations the knob is removed and a screwdriver is used to make settings, replace the knob and then minor temperature adjustment may be made.

ALMAC TRANSFER LINE KIT Model 160-N

List price \$55.00

Complete kit ready to install. Includes 6' flexible nylon tubing, relief valve; ¼" orifice, 10 watt, 115 volt AC, normally closed solenoid valve and all required fittings.

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MODEL	DESCRIPTION	PRICE
10-NT	Hand valve operated pressure withdrawal for LD-10 container	47.50
25-NT	As above for LD-25 container	47.50
50-NT	As above adjustable for standard narrow neck containers, 15, 25 or 50 liter size	47.50
TM-2	Two cylinder manifold and relief valve for LS-110 or LS-160	36.45
TM-4	Four cylinder manifold and relief valve for LS-110 or LS-160	66.45
AC-8	Container repair brochure (prices available on request)	
NS	Nylon tubing 3/8" O.D., price per foot	.30
FN	Female flare nut, 3/8"	.25
FA	3/8" 45° male flare to 1/4" MPT adaptor	.35
FT	Nylon flaring tool	13.50
FC	Nylon tubing cutter	3.50
SG	Plastic safety glasses with side protection	.60
FS	Face shield	3.95
LG	Leather gloves, seperate fingers, X-large	3.00
110-V	2-way liquid nitrogen solenoid, 115 V ac 1/4" orifice	20.50
RV-3	1/8" NPT 3# relief valve	7.40
RV-6	1/8" NPT 6# relief valve	7.40
RV-235	1/4" NPT 235# relief valve	6.45
CR-25	Automatic liquid nitrogen container filler stand tank to smaller containers	225.00
AF-T	Filler tube for narrow neck 15, 25 & 50 liter containers	18.95
AF-T-2	Combination filler tube for narrow neck 15, 25, 50 and LD-25 containers	25.00
AN-4	Filler nozzle for LD-4	25.50
AN-25	Filler nozzle for LD-10 and LD-25 containers	25.50
TH-15	Flexible transfer line 3 ft. long, both ends have 3/8" female flare nuts	18.95
CR-160	Automatic liquid nitrogen container filler stand tank to LS-110 or LS-160	225.00
S-160	1/4" NPT two-way liquid nitrogen solenoid	80.00
RSV	Replacement sensing unit for CR-25 or CR-160 (specify model when ordering)	50.00
AF-1	Temperature control -150°F to +200°F	95.00
CR-II	Temperature control -320°F to -300°F	145.00
WTC	Thermocouple control -330°F to +180°F	275.00
110N-AF	Orificed solenoid transfer kit for LS-110 or 160	57.50
AF-200	Cryogenic thermometer -220°C to +30°C	9.95
BV-1	3/8" ball valve, modified	12.00
110TL-1	1/2" female flare to male 3/8" flare with 6 ft. of 3/8" nylon tubing	6.95
110TL-Q	Quick action shut-off assembly for LS110 or 160	39.95
220TL-Q	Two quick action valves for one LS-110 or 160	64.95
220TL-Q-2	Above valve set one with phase seperator and one with 6' nylon tubing	79.95
220TL-Q-3	Model 220TL-Q with one phase seperator and one model AF-T filler tube	99.95

MODEL	DESCRIPTION	PRICE
220TL-Q-4	Model 220TL-Q with one phase seperator and 3 ft. flex hose	117.00
220TL-Q-5	Model 220TL-Q with one phase seperator and Model AN-25 filler nozzle	121.00
P4-1	Phase seperator complete to fit LS-110 or 160	25.00
DP-1	Platform shelf with snap band to rest dewars while filling from LS-110 or 160	25.00
CD-1	LS-110 or 160 dolly	39.00
110-HT	LS-110 or 160 hand truck	69.50
CD-2	Small container dolly, 21" diameter	16.95
CD-3	Small container dolly, 24 1/2" diameter	18.95
TT	Teflon tape, sizes and prices on request	
CC	Welding cylinder trucks, catalog & prices available on request	
LN-C	Liquid nitrogen bell alarm, all copper sensor	75.00
LN-S	Liquid nitrogen bell alarm, copper capillary terminating with stainless 115 V ac 60 cycle	75.00
CR-C-S	Liquid nitrogen level control for easy access traps	160.00
C-S	Replacement sensor for above	50.00
CR-C-C	Liquid nitrogen level control for baffle traps with curved entry ports	160.00
C-C	Replacement sensor for above	50.00
CR-P-S	Model CR-C-S control in 19" panel form	175.00
R-S	Replacement sensor for Model CR-P-S	60.00
CR-P-C	Model CR-C-C in 19" panel form	175.00
R-C	Replacement sensor for Model CR-P-C	60.00
25-SP	Solenoid operated transfer line for LD-25	57.50
50-SP	Solenoid operated transfer line adjustable for standard narrow neck 15, 25 & 50 liter containers	57.50
110-SP	Solenoid operated transfer line for LS110 or 160	59.50
220-SP	Double solenoid operated transfer line for LS-110 or 160 containers	87.50
CR-C	Automatic liquid nitrogen small container filler from LS-110 or 160 to smaller container 115V ac	195.00
CR-TL	Solenoid operated transfer line for CR-C, specify small container's size and manufacturer, price available upon request	
TC-100	Complete temperature chamber for operation from LS-110 or 160	200.00
CR-F	Model TC-100 with controlled rate freezing	350.00
PT-1	Mechanics pick-up tool, useful for retrieving ampules in biological freezers	2.00
BB-1	Rubber protectors for LD-25 containers	4.00
T-1	One quart glass vacuum bottle	3.00
SC-1	Compression adaptor fitting for 1/8" O.D. stainless sensor to 1/8" NPT	1.50
AM-1	Male acme nut, fits LS-110 and 160	8.95
AM-2	Female acme nut with 1/4" MPT nipple fits LS110 or 160	8.95
PN-C	Pneumatic level control for LS-110 or 160, all copper sensor	
PN-S	As above, sensor terminating with 1/8" stainless steel	
PN-CF	Pneumatic container filler, details to be announced	
PN-V	Pneumatic valve, price upon request	

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